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10/642.228	08/18/2003	Taro Yokoi	040302-0341	2984

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EXAMINER

ECHELMEYER, ALIX ELIZABETH

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/642,228

Applicant(s)

YOKOI, TARO

Examiner

Alix E. Echelmeyer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8-18-03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) 4, 6, and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Specification

2. The disclosure is objected to because of the following: the acronyms and variables on pages 6-16 used to describe the logic process by which the control system determines how the fuel cell system should be run are confusing. Many of the acronyms and variables are not identified before they are used.

Appropriate correction is required.

Claim Objections

3. Claims 4, 6 and 14 are objected to because of the following informalities: in claim 4, the third clause says "when the fuel-line water discharge flow passage closure unit is opened *or during* a given time ...". Claim 6 says "a flow sectional area of a *downstream* of the fuel-line ...". Claim 14 says "preparing *an* fuel-line water discharge ...". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 8, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Komura et al. (6,242,119). Komura teaches the fuel-line water tank (column 4, lines 12-14); a fuel-line water discharge discriminator (column 3 lines 38-39); a combustor to combust excess fuel from the fuel line with oxidant expelled from the oxidant electrode outlet (column 4 lines 12-15); and a valve to allow for the discharge of water from the water recovery tank (column 3 lines 40-42). The intended use of the valve, as described in Claim 1 of the application, to open when the discriminator discriminates that the collected water is to be discharged, can be achieved by Komura with the control circuit (column 3 lines 38-41).

Claim 8 is rejected under Komura because it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). The fuel cell in Komura contains a control circuit that has the ability to discriminate when the water should be discharged based on the water level in the tank. Modifying the control circuit

to use different data to determine whether the water in the tank should be discharged does not result in a patently distinct invention.

The examiner has considered the means plus function language of Claim 13 and found that the claim does not invoke U.S.C. 112 paragraph 6 because there is too much structure in the language of the claim, causing it to fail the third prong of the test.

All aspects of Claim 14 are addressed above, except for the first part of the claim that discusses the preparation of a fuel cell having a fuel electrode outlet and an oxidant electrode outlet. Since these outlets are essential to the preparation of a fuel cell and the remaining parts of the claim are rejected, Claim 14 is rejected as being anticipated by Komura.

6. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Komura et al. (6,242,119). Komura teaches an oxidant-line water recovery tank that collects water discharged from the oxidant electrode outlet of the fuel cell (column 4 lines 15-18).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komura et al. (6,242,119). Komura discloses the claimed invention except that the oxidant-line water recovery tank (column 4 lines 15-18) is not downstream of the fuel-line water recovery tank; instead, it is in parallel with the fuel-line water recovery tank and both tanks drain into one water recovery tank. It would have been obvious to one having ordinary skill in the art at the time the invention was made to place the oxidant-line water recovery tank downstream of the fuel-line water recovery tank, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Claim 4 further claims a flow passage closure unit and a discriminator used to determine whether the tank should be emptied. The water level sensor and valve associated with Komura's water recovery tank (column 2 lines 49-51) both read on these aspects of applicants' invention. Further, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). The control system of Komura can be used to discriminate how much water should be discharged from the system using the data from the discriminators employed to determine the amount of water in the tanks and the time between discharges.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to add the flow passage closure unit and discriminator to the water recovery tank in order to allow for the discharge of water from the tank when it was determined that the water should be discharged.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komura et al. (6,242,119) in view of Perry, Jr. et al. (5,192,627).

Komura teaches the fuel cell system according to claim 1 (see number 5), but fails to teach a fuel pressure detector in a fuel gas flow passage connected to a fuel electrode inlet of the fuel cell.

Perry teaches a fuel pressure detector located in a fuel gas flow passage connected to a fuel electrode inlet of the fuel cell (column 4 lines 44-47). This detector is connected to the microprocessor control system, giving the system the ability to use the information from the fuel pressure sensor to determine whether the water discharge flow passage should be opened or closed.

It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). The intended use of the fuel pressure detector according to the application is to determine when the water in the fuel-line water recovery tank has been discharged. Since the controller in Perry can use data collected from the fuel pressure

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sensor in any manner for which it is programmed to do, it has the ability to be used in the manner in which the applicant is claiming.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use a fuel pressure detector in communication with a control system to control certain aspects of the fuel cell system.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komura et al. (6,242,119). The valve taught by Komura (column 2 lines 49-51) must, because it is a valve and is used to stop flow of water, have a smaller flow sectional area than an area downstream of the valve along the water discharge flow passage. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use a valve to create a flow sectional area smaller than an area downstream along the water discharge flow passage.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komura et al. (6,242,119) in view of Perry, Jr. et al. (5,192,627).

Komura teaches the fuel cell system according to claim 1 (see number 5), but fails to teach a fuel pressure sensor located at the inlet of the fuel electrode of a fuel cell.

Perry teaches a fuel pressure detector located in a fuel electrode inlet of the fuel cell that is capable of measuring the pressure of the fuel gas (column 4 lines 44-47). The fuel pressure detector communicates with the microprocessor control system

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(column 9 lines 55-59) contained in the fuel cell system. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Thus, the information collected by the fuel pressure detector can be used by the microprocessor control system in a determination of whether the discharging of the water recovery tank is complete.

Since the pressure in the fuel line entering the inlet of the fuel electrode of the fuel cell is related to the flow rate of the fuel entering the fuel cell and the fuel pressure detector communicates with the microprocessor control system, the flow rate of the fuel entering the fuel cell can be calculated. Or, the fuel pressure detector could be replaced with a fuel flow rate detector, eliminating the need to calculate the flow rate based on the pressure.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a fuel pressure detector, or instead, a fuel flow rate detector to the fuel electrode inlet of the fuel cell to provide information to the control system, allowing it to better control the fuel cell system.

12. Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komura et al. (6,242,119) in view of Perry, Jr. et al. (5,192,627).

Komura teaches the fuel cell system according to claim 1 (see number 5) but fails to teach a fuel-line gas flow sensor located downstream of the fuel cell.

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Perry teaches a fuel-line gas flow sensor located downstream of the fuel cell (column 11 lines 8-13). Since the sensor communicates with the microprocessor control system (column 9 lines 55-59), it has the ability to do the actions claimed by the applicant.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to add a fuel-line gas flow sensor that communicates with the control system in order to use the information from the sensor to better control the fuel cell system.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komura et al. (6,242,119) in view of Perry, Jr. et al. (5,192,627).

Komura teaches the fuel cell system according to claim 1 (see number 5) but fails to teach a fuel pressure detector disposed in a fuel electrode inlet of the fuel cell.

Perry teaches the fuel-line gas discharge discriminator along the fuel-line of gas expelled from the fuel cell according to claim 9 (see number 12 above). Perry also teaches a fuel pressure detector in a fuel electrode inlet of a fuel cell (column 4 lines 44-47). The detector of Perry is attached to the microprocessor control system of the fuel cell system (column 9 lines 55-59). It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Thus, the microprocessor control

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system of Perry can be used to determine time intervals over which passage closure units have been opened and whether discharging is completed.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to put a fuel-line pressure detector in a fuel electrode inlet of the fuel cell and attach it to the control system of the fuel cell system in order to use the information from the pressure sensor along with the information from the gas discharge discriminator downstream of the fuel cell to better control the fuel cell system.

14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komura et al. (6,242,119) in view of Perry, Jr. et al. (5,192,627).

Komura teaches the fuel cell system according to claim 1 (see number 5) but fails to teach a fuel flow rate detector connected to a fuel electrode inlet of the fuel cell.

Perry teaches the fuel-line gas discharge discriminator along the fuel-line of gas expelled from the fuel cell according to claim 9 (see number 12 above). Perry teaches a fuel pressure detector located in a fuel electrode inlet of the fuel cell that is capable of measuring the pressure of the fuel gas (column 4 lines 44-47). The fuel pressure detector communicates with the microprocessor control system contained in the fuel cell system (column 9 lines 55-58). It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Thus, the information collected

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by the fuel pressure detector can be used by the microprocessor control system in a determination of whether the discharging of the water recovery tank is complete.

Since the pressure in the fuel line entering the inlet of the fuel electrode of the fuel cell is related to the flow rate of the fuel entering the fuel cell and the fuel pressure detector communicates with the microprocessor control system, the flow rate of the fuel entering the fuel cell can be calculated. Or, the fuel pressure detector could be replaced with a fuel flow rate detector, eliminating the need to calculate the flow rate based on the pressure.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the time of invention to add a fuel pressure detector or, instead, a fuel flow rate detector to the fuel electrode inlet of the fuel cell to provide information to the control system, allowing it to better control the fuel cell system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix E. Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alix E Echelmeyer
Examiner
Art Unit 1745

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